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<b>(21) International Application Number:</b> PCT/AU95/00687 <b>(22) International Filing Date:</b> 19 October 1995 (19.10.95) <b>(30) Priority Data:</b> PM 8912 19 October 1994 (19.10.94) AU <b>(71)(72) Applicant and Inventor:</b> DIXON, Barry, James [AU/AU]; P.O. Box 716, Southport, QLD 4215 (AU). <b>(74) Agent:</b> GARDNER, John, R., G.; P.O. Box 443, Mudgeeraba, QLD 4213 (AU).		<b>(81) Designated States:</b> AL, AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG).  <b>Published</b> <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
<b>(54) Title:</b> IMPROVEMENTS TO CHAIRS  <b>(57) Abstract</b> <p>A seat (10) for a chair having a base (11) and ridges (13) which extend transversely of the base (11). The ridges (13) are raised and are engaged by the Ischial Tuberosities of a person sitting on the seat (10) to prevent a person sliding from the seat (10).</p> <div data-bbox="876 1134 1396 1722"><p>The diagram shows a top-down view of a chair seat (10). It consists of a rectangular base (11). On the base, there are two rectangular ridges (13) positioned side-by-side. A label 12 points to the base area, and a label 14 points to the space between the two ridges.</p></div>		
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IMPROVEMENTS TO CHAIRSTechnical Field

This invention relates to improvements to chairs and in particular to an improved seat design for chairs.

- 5 The present invention has particular but not exclusive application to chairs of the type which have a forwardly tilted seat or a seat which allows for some degree of forward tilting movement.

Background Art

- 10 Chairs of many different designs are currently available. In many chair designs, the most common seat configuration is one in which the seat is substantially flat or of a slightly backward tilt. Where a person is sitting on such a seat in an unsupported upright position,  
15 the person's weight is largely born on, and balanced over the Ischial Tuberosities of the pelvis. If the knees are elevated higher than the hips, the pelvis is tilted back and a less desirable posture results. In improved chair designs, the seat is provided with a forward tilt to  
20 encourage a more erect posture. Using such chair designs, the knees are lower than the hips and the normal curve of the spine is encouraged. As the tilt of the chair seat increases however, a stop or knee rest is required to be provided to prevent a person seated on the chair from  
25 sliding off the seat. The use of stops or knee rests however, create certain difficulties as considerable pressure is applied to the knees which can thus be aggravated. Furthermore, chairs of this design reduce the freedom of movement of the person's posture and  
30 additionally the chairs themselves are more cumbersome.

Summary of the Invention

- The present invention aims to overcome or alleviate one or more of the above disadvantages by providing an improved chair which has a forwardly tilting  
35 seat to maintain postural advantages but which does not result in pressure on the knees of a person using the seat. The present invention also aims in a preferred aspect to provide a chair which may be constructed of a substantially

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compact form. The present invention aims in a further preferred aspect to provide a chair which does not limit freedom of movement of the person's posture. Other objects and advantages of the invention will become apparent from  
5 the following description.

The present invention thus provides a seat for a chair, said seat having raised ridge means rearwardly of the leading edge thereof and extending transversely of said seat, said ridge means defining an abutment to prevent or  
10 resist a person sliding from said seat.

Preferably, the seat is inclined downwardly and forwardly and the ridge means is raised above the normal surface of the seat.

The ridge means is suitably shaped to define a  
15 substantially level surface for the Ischial Tuberosities of the pelvis of the person to prevent the person sliding from the seat.

In a preferred form, the ridge means has in cross section, a curved upper surface so as to have an external  
20 substantially convex configuration. In a particularly preferred form, the ridge means is defined in two spaced apart ridge sections with the space therebetween preventing excess pressure on the front of the centre of the pelvis. The sections of the ridge means may either be substantially  
25 parallel and transversely aligned with each other or alternatively may be angled to each other. When angled to each other, the ridge sections may be angled inwardly towards each other from the outer sides of the seat towards the centre thereof.

30 The ridge sections may be defined by the base of the seat, by an insert or inserts in or on the seat or by a suitably shaped cushion on the base of the seat. Where defined by the base of the seat, the base may be shaped to incorporate the ridge means or ridge sections and  
35 is covered by suitable cushioning such as foam plastics or other resilient material. Where defined by an insert or inserts, the insert or inserts may be interposed between the base of the seat and cushioning. Where defined by the

cushioning applied to the base of the seat, the cushioning is shaped to define the ridge means or ridge sections.

The seat configuration of the invention may be applied to chairs having a seat of fixed inclination or of  
5 a variable inclination.

#### Brief Description of the Drawings

In order that the invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a  
10 preferred embodiment of the invention and wherein:-

Fig. 1 illustrates schematically in plan view a seat of a chair according to the present invention with covering and padding removed;

15 Figs. 2 and 3 illustrate in sectional view the seat of Fig. 1 in different tilted positions;

Figs. 4, 5 and 6 illustrate alternative constructional details of the seat of the invention; and

20 Fig. 7 illustrates schematically in plan view an alternative seat configuration according to the invention.

#### Detailed Description of the Embodiment

Referring to the drawings and firstly to Fig. 1 there is illustrated a chair seat 10 according to the  
25 present invention, including a base portion 11 of a generally conventional perimeter shape and having adjacent, but rearwardly of its forward or leading edge 12, a pair of raised ridges 13. The ridges 13 extend generally transversely of the base portion 11, being aligned and  
30 extending generally parallel to each other. The ridges 13 are spaced apart to define a gap 14 therebetween.

As shown more clearly in Figs. 2 and 3, the ridges 13 have in cross-section a convex upper surface 15. In the embodiment of Figs. 2 and 3 the ridges 13 are shown  
35 as inserts and are covered by a cushioning material 16 such as a foam plastics material. The seat 10 is normally tilted downwardly and forwardly and may be fixed at different inclinations as shown in Figs. 2 and 3 or may be

adjustable between those inclinations such as by being pivotally mounted to the frame of the chair. In a range of tilted positions, as shown, the Ischial Tuberosities 17 of the pelvis 18 is on an effectively level surface due to the raised ridges 13 regardless of the degree of seat tilt. This enables the muscular and skeletal structures with the upper legs sloping downward to encourage the slightly forward tilted position of the pelvis 18 required for maintaining the normal spinal curvature in a balanced sitting posture. The ridges 13 forwardly of the level support of the Ischial Tuberosities reduce the tendency to slide off the seat.

The ridges 13 in the chair seat 10, may be defined through a number of alternative arrangements. For example, as shown in Fig. 4, the base portion 11 of the seat 10 is provided with an integral convex deformation or deformations 19 which define the ridges 13. Padding or cushioning 20 is then applied over the base portion 11, the padding or cushioning following the profile of the convex deformation 19.

In the configuration of Fig. 5, the base portion 11 is of a standard form and the ridges 13 are defined within or by foam padding 21, the padding 21 being thickened to form the ridges 13. In the configuration of Fig. 6, the base portion 11 is again of conventional form and the ridge portions 13 are defined by separate inserts 22 interposed between the base portion 11 and padding 23. Any of the configurations described above will be effective in defining the ridges 13 which will prevent slipping from an inclined chair seat 10 without external constraint.

In the preferred form of the seat 10 of the invention the ridges 13 are separate and extend substantially parallel to each other and are aligned as shown in Fig. 1. In the configuration of Fig. 7, however, the ridges 13' may be angled inwardly towards each other and the leading edge 12 of the base portion 11.

Whilst the ridges 13 and 13' are shown as separate elements, they may be continuous across the base

portion 11 in which case the gap 14 is eliminated. For the purposes of comfort however, the gap 14 is preferably provided between the ridges 13 or 13'.

Furthermore, whilst the ridges 13 are shown to  
5 have a convex upper configuration, they may have other cross-sectional configurations. For example, the ridges 13 may be of a somewhat triangular form in cross-section with the apex uppermost or alternatively of rectangular form in cross-section. The ridges 13 may also be of other  
10 cross-sections which will perform the function described above and which will provide comfort to the user of the seat 10.

In each of above configurations, it will be apparent that the thickness of the seat 10 in the region of  
15 the ridge sections 13 is greater than in regions away from the ridge sections 13. In some configurations however, the seat 10 may be of a constant thickness where for example the base portion 11 is shaped to form the ridge sections 13. For example, the base portion 11 may be formed of a  
20 rigid sheet of substantially constant thickness which may be shaped to define the ridge sections 13. The padding or cushioning then may be of a constant thickness applied over the base portion 11.

The base portion 11 of the seat 10 may be formed  
25 of any suitable material such as timber, metal or plastics and the padding for the seat may comprise any cushioning material such as a resilient plastics material. The seat 10 is normally incorporated into office-type chairs however it may be used in many different styles of chair

30 Whilst the above has been given by way of illustrative embodiment of the invention, all such modifications and variations thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of the invention as herein defined in  
35 the appended claims.

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CLAIMS

1. A seat for a chair, said seat having raised ridge means rearwardly of the leading edge thereof and extending transversely of said seat, said ridge means defining an  
5 abutment to prevent or resist a person sliding from said seat.
2. A seat according to Claim 1, said seat being inclined downwardly and forwardly.  
10
3. A seat according to Claim 1 or Claim 2 wherein said ridge means is shaped to define a substantially level surface for the Ischial Tuberosities of a person sitting on said seat.  
15
4. A seat according to any one of the preceding claims wherein said ridge means has in cross section, a curved upper surface so as to have an external substantially convex configuration.  
20
5. A seat according to any one of the preceding claims wherein said ridge means is defined in two spaced apart ridge sections.
- 25 6. A seat according to Claim 5 wherein said sections of said ridge means are substantially parallel and transversely aligned with each other.
7. A seat according to Claim 5 wherein said ridge  
30 sections are angled inwardly towards each other from the outer sides of said seat towards the centre thereof.
8. A seat according to any one of the preceding claims wherein said seat includes a base and wherein said  
35 ridge means are defined by said base.
9. A seat according to any one of the preceding claims wherein said seat includes a base and wherein said

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ridge means are defined by an insert or inserts on said base.

10. A seat according to any one of the preceding 5 claims wherein said seat includes a base and wherein said ridge means are defined by shaped cushioning on said base.

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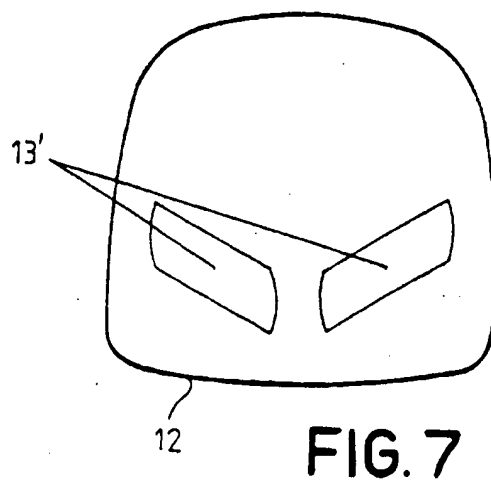
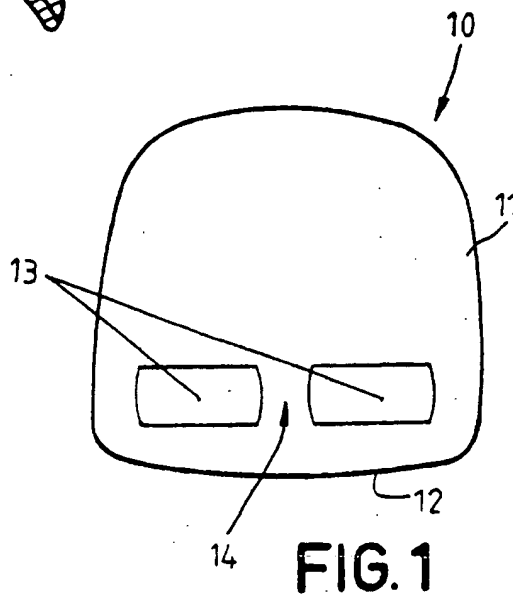
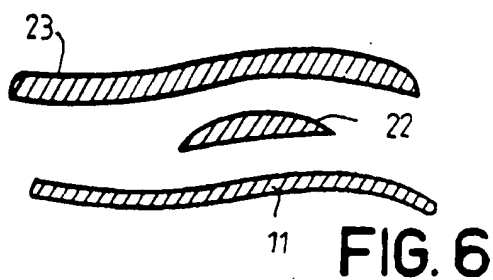
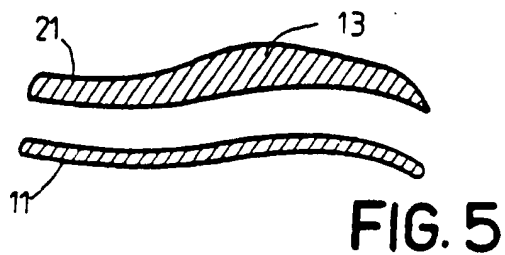
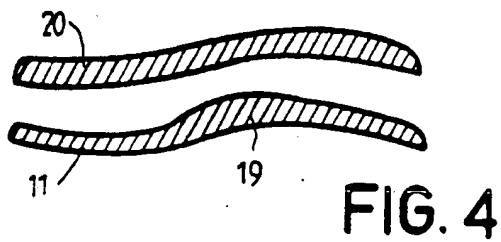
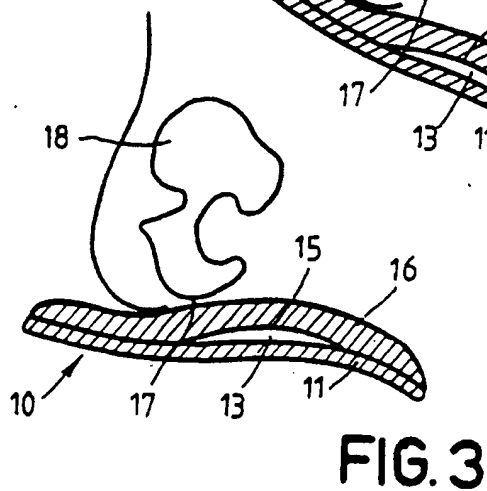
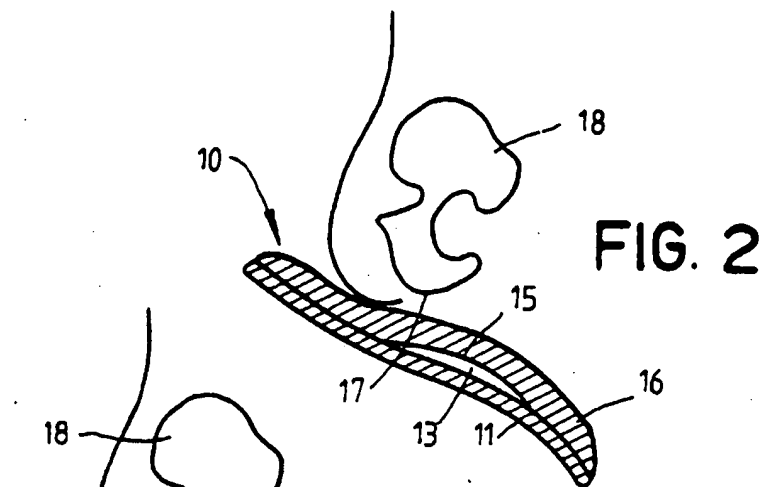
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# INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/AU 95/00687

## A. CLASSIFICATION OF SUBJECT MATTER

Int Cl<sup>B</sup>: A47C 7/02, 7/18

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC : A47C 7/02, 7/18

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

AU : IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DERWENT

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 87/07124 A (GREGORY) 3 December 1987 page 3 line 15 - page 5 line 4; figs 1, 3	1-10
X,P	US 5395162 A (JAY et. Al.) 7 March 1995 whole document	1-10
X	WO 85/00735 (SAAB-SCANIA AG) 28 February 1985 page 3 line 28 - page 6 line 4; figs. 1-4	1-10



Further documents are listed in the continuation of Box C



See patent family annex

### \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance  
 "E" earlier document but published on or after the international filing date  
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  
 "O" document referring to an oral disclosure, use, exhibition or other means  
 "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone  
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art  
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Date of the actual completion of the international search

29 March 1995

Date of mailing of the international search report

27 MARCH 1996

Name and mailing address of the ISA/AU  
 AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION  
 PO BOX 200  
 WODEN ACT 2606  
 AUSTRALIA Facsimile No.: (06) 285 3929

Authorized officer

A. ALI

Telephone No.: (06) 283 2607

# INTERNATIONAL SEARCH REPORT

International Application No.

PCT/AU 95/00687

C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4489982 A (MORROW) 25 December 1984 whole document	1
X	US 5137333 A (CHEE) 11 August 1992 whole document	1-10
X	US 4951336 A (SILVERMAN) 28 August 1990 claim 1, abstract, figures	1-10
X	WO 94/06325 A (JAY MEDICAL LTD.) 31 March 1994 whole document	1-10
X	WO 91/03969 (POWELL) 4 April 1991 whole document	1-10
X,P	WO 95/05106 A (JAY MEDICAL LTD.) 23 February 1995 whole document	1-10
X	DE 4005075 A (ARNOLD) 23 August 1990 abstract; figs 1-4	1-10
A,P	US 5414884 A (MACKENZIE) 16 May 1995 whole document	1
A	WO 93/00029 A (OWEN) 7 January 1993 whole document	1

## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/AU 95/00687

### Information on patent family members

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
WO	8707124	AU HK	73415/87 462/95	CA NO	1276732 880283	EP US	272286 4889387
US	5295162	AU	27673/95	WO	9533396		
WO	8500735	EP	153360	SE	8304347	US	4637651
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US	5137333						
US	4951336						
WO	9406325	US	5352023	US	5490299		
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DE	4005075	EP	460017	WO	9009751		
US	5414884						
WO	9300029	AU	21724/92	US	5439270		
END OF ANNEX							